REMARKS

In an office action mailed on 3/10/2006, claims 27,29-32, 34,36-38, and 40 are rejected under 35 USC 102(e) as anticipated by Grabelsky, US 6678250; claims 28,33, and 35 are rejected under 35 USC 103(a) as unpatentable over Grabelsky in view of Bearden, US 2003/0086425.

Grabelsky Does Not Teach Weighting of Contributors

One aspect of claims 27, 34, 39, and 40 (as amended) is weighing contributors to performance metrics for lower levels of the network into the metric of network performance for the higher level of the network, the contributors weighted according to their effect on the performance metrics. Grabelsky merely teaches testing network performance parameters such as packet delivery delay, packet loss, and jitter against alarm thresholds. The network performance parameters are compared to determine if they exceed alarm thresholds. Exceeding the alarm condition causes the process to trap, and an external alarm processing routine to be invoked. See Col. 11 lines 46-50 & Col. 11, lines 54-67 thru Col. 12, lines 1-2.

Grabelsky teaches comparing data to thresholds and setting off an alarm, not weighting contributions according to their effect on network performance.

Likewise, one aspect of claim 31 is the performance metrics for lower levels weighted according to at least one of (1) perceived impact on network performance, and (2) perceived priority among performance metrics. Nothing of the kind is taught in Grabelsky, as cited.

Claim 40 is distinct for at least another reason. In particular, Grabelsky teaches alarms if metrics exceed a threshold, but does not teach the performance metrics for lower topological layers assigned one or a plurality of pre-determined performance levels, as recited in claim 40.

Grabelsky Does Not Teach Separate Combining of Capacity/Traffic and Connectivity Metrics

One aspect of claim 29 is a data-processing apparatus configured to combine, separately, (1) performance metrics obtained by the network-metrics apparatus for lower topological levels and related to network capacity and/or traffic into a metric of network capacity and/or traffic for a higher topological level of the network, and (2) performance metrics obtained by the network-metrics apparatus for lower topological levels and related to network connectivity into a metric of network connectivity for a higher topological level of the network.

Grabelsky teaches that Phase 0 processing determines the following network performance parameters, including: Round trip delay, Jitter, Packet Loss, both fractional and cumulative, and Receive buffer length. See Grabelsky, Col. 13, lines 6-20.

There is no teaching in Grabelsky, as cited, of separately combining capacity/traffic metrics and, separately, metrics related to network connectivity.

Grabelsky Does Not Teach Normalizing Raw Data

One aspect of claim 32 is normalizing raw data related to network performance to obtain the performance metrics for lower topological levels of the network.
Grabelsky teaches that Phase 2 processing uses the Phase 0 data to maintain and update a long-term monitoring Phase 2 database. The Phase 2 database is an accumulation of the raw network performance data from each session over a long interval. The Phase 2 data may also include the statistics from each period of Phase 1 processing. See Grabelsky, Col. 12, lines 31-45.

There is no teaching in Grabelsky, as cited, of normalization of the raw data to obtain performance metrics.

Grabelsky Does Not Teach Determination of Root Causes vs Factors

One aspect of claim 36 is the first-metric determining means for determining if the raw data is a root cause or a factor in the root cause of performance degradation for lower topological layers of the network, and to weight the raw data accordingly when forming the performance metrics for lower topological layers of the network.

Nothing is Grabelsky, as cited, suggests determination of whether raw data is a root cause or merely a factor in performance degradation.

Likewise, one aspect of claim 37 is promoting the raw data from a factor to a root cause when the raw data is found to have a direct correlation on network performance, and/or for demoting the raw data to a factor from a root cause when the raw data is not found to have a direct correlation on network performance.

Nothing is Grabelsky, as cited, suggests promoting/demoting to and from root causes.

Bearden Does Not Teach Collecting/Combining Cable Modem Hour Metrics

One aspect of claims 28, 33, 35, and 39 is collecting/combining a cable modem hour metric for lower-level elements of a broadband network. Bearden teaches discovering the topology of a target network be identifying the set of devices in the network, the function of each (e.g., router, switch), and interconnections between devices in the network. In particular, topology discovery identifies the path between any two devices in a target network. See Par. 89.

Claim 39 also recites using the cable modem hour metric to determine amounts of time that the lower-level network elements are degraded for a plurality of performance issues. Bearden teaches that end-to-end delay from a source to a destination refers to the difference between the time the source sends the first bit of a packet to a destination and the time the destination receives the last bit of that packet. Jitter refers to variation in delay, illustratively the running average of the differences in inter-packet arrival times. Packet loss from a source to a destination during an interval refers to the ratio of the number of packets lost to the number of packets sent during that interval. Packet burst

during an interval refers to the maximum number of consecutive packets lost during that interval. See Par. 84.

There is no teaching in Bearden, as cited, of collecting/using a cable modem hour metric to determine amounts of time that lower-level network elements are degraded. In fact, a search of Bearden reveals no references to cable modem hours whatsoever.

Bearden, Paragraphs 196 and 197 teach that for each hop on the layer-3 path (532), the algorithm finds the layer-2 path (533). Finally, the two sets of paths need to be combined (534). There is no teaching of, for each issue, combining the amounts of time that the lower-level network elements are degraded to determine cumulative amounts of time degraded.

Bearden, Paragraph 234 teaches that each dot (could be colored red) and the grey lines emanating from it represent the average and the minimum and maximum value, respectively, of the particular QoS metric statistic for the calls. The shaded rectangles (could be colored green to denote within threshold) represent the acceptable values of the corresponding QoS statistic. Again, there is no teaching of, for each issue, combining the amounts of time that the lower-level network elements are degraded to determine cumulative amounts of time degraded.

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